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Instructions for use

ON THE SPECIES OF *POLYSPHINCTA* GRAVENHORST AND *ZATYPOTA* FÖRSTER FROM JAPAN

(Hymenoptera, Ichneumonidae)

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In the following pages is given a revision of the Japanese species of the genera *Polysphincta* GRAVENHORST and *Zatypota* FÖRSTER, two new species of *Polysphincta* and one new species of *Zatypota* being described. The types of these new species are preserved in the collection of the Entomological Institute, Hokkaido University, Sapporo.

Genus *Polysphincta* GRAVENHORST

Polysphincta GRAVENHORST, Ichn. Eur., 3: 112 (1829).

Genotype: *Polysphincta tuberosa* GRAVENHORST.

Under the genus *Polysphincta* four species have hitherto been recorded in Japan. In the course of the present study, however, the writers have found that one of these species, viz. *P. stigmata* UCHIDA, 1941, should be transferred to *Laufeia* TOSQUINET. Then, there are five species including two new ones occurring in the country. These species can be distinguishable by the following key.

Key to the Japanese species

1. Abdomen strongly and coarsely punctured, with very strong elevations in tergites 2 to 6. Nervellus strongly reclivous, barely broken below middle or virtually unbroken, the total length about half as long as submediella. *tuberculata* UCHIDA
- Abdomen virtually impunctate or very finely punctate, with elevations weak or almost obsolete. Nervellus perpendicular or reclivous, in the latter case it is strongly broken at or near middle, the total length about third as long as submediella or shorter. 2
2. Malar space very short or almost obliterated. Propodeum not carinate, occasionally only feebly rugulose above petiolar area. Intercubitus about as long as abscissa 2 of cubitus or only slightly shorter. Nervellus broken at or near middle, with discoidella constantly distinct. Legs stout, hind femora in ♀ less than four and a half times as long as wide. 3
- Malar space more than half as long as basal width of mandible. Propodeum distinctly carinate. Intercubitus about half as long as abscissa 2 of cubitus or shorter. Nervellus unbroken or broken, without distinct discoidella.

- Legs less stout, hind femora in ♀ about six times as long as wide. . . . 4
3. Scutellum and postscutellum yellow. Abdominal tergites usually each with a broad apical yellowish band. Basal tergite short and rather broad, about one and a half times as long as apical width or shorter. Tergite 2 about as long as apical width or weakly transverse. *nikkoensis* UCHIDA
 - Scutellum and postscutellum entirely black. Abdomen black throughout, occasionally only the apical tergites narrowly margined with white or yellow. Basal tergite slender, fully twice as long as apical width. Tergite 2 distinctly longitudinal, about one and a half times as long as apical width. *tenuiabdominalis* UCHIDA
 4. Ocellar diameter about as long as ocellocular space. Petiolar area of propodeum defined by a sharp carina above. Radius originating from middle of stigma. Intercubitus about half as long as abscissa 2 of cubitus. Nervellus broken at middle. *unicarinata* sp. nov.
 - Ocellar diameter shorter than ocellocular space. Petiolar area of propodeum not so sharply defined but with a X- or H-shaped carina above. Radius originating from distinctly before middle of stigma. Intercubitus very short. Nervellus unbroken. *varicarinata* sp. nov.

Polysphincta tuberculata UCHIDA

Polysphincta tuberculata UCHIDA, Ins. Mats., 6: 156 (1932); *ibid.*, Ins. Mats., 15: 122 (1941).

Specimens examined: 1 ♀ (Holotype), Gifu, 30/v. 1931, S. KARIYA leg.; 1 ♀, Hyogo, S. MATSUMURA leg.; 1 ♀, Sasayama, Hyogo, 12/ix. 1952, K. IWATA leg.; 1 ♀, Korasan, Kochi, 15/v. 1955, K. MORIMOTO leg.

Host: *Cylosa octotuberculata* KARSCH (after IWATA, 1942).

The life history of this species was reported by IWATA in 1942.

Distribution: Japan (Honshu and Shikoku).

Polysphincta nikkoensis UCHIDA

Polysphincta nikkoensis UCHIDA, J. Fac. Agr., Hokk. Imp. Univ., 25: 70 (1928); *ibid.*, Trans. Sapp. Nat. Hist. Soc., 11: 87 (1930); *ibid.*, Ins. Mats., 15: 120 (1941).

Specimens examined: 1 ♀, Sapporo, Hokkaido, 8/ix. 1917, 1 ♂, *ibid.*, 3/ix. 1918, S. MATSUMURA leg.; 1 ♀, *ibid.*, ix. 1926, 6 ♀♀, *ibid.*, 20/ix. 1940, T. UCHIDA leg.; 1 ♀, *ibid.*, 10/x. 1929, C. WATANABE leg.; 1 ♀, *ibid.*, 8/viii. 1956, S. MOMOI leg.; 1 ♀, Chitose, Hokkaido, 24/x. 1945, S. SAKAGAMI leg.; 1 ♀, Hakodate, Hokkaido, 30/viii. 1955, K. HOMMA leg.; 1 ♀, Iwate, 10/ix. 1943, OGASAHARA leg.; 1 ♀, Utsunomiya, Tochigi, 27/ix. NAKAMURA leg.; 2 ♀♀ (including Holotype), Nikko, Tochigi, ix. 1926, F. SCRIBA leg.; 1 ♀, Karuizawa, Nagano, 25/vii. 1918, M. SUZUKI leg.; 1 ♀, Nagano, 16/viii. 1946, K. KAMIJO leg.; 1 ♀, Fukui, 5/viii. 1955, Y. MURAKAMI leg.; 1 ♀, Ishikawa, 23/vi. 1955, S. TAKAGI leg.; 1 ♀, Kyoto, 5/v. 1930, K. TAKEUCHI leg.; 1 ♀, Osaka, 17/v. 1931, K. IWATA leg.; 1 ♀, Hyogo, 2/vii. 1930; 1 ♀, Sasayama, Hyogo, 26/ix. 1950, 1 ♀, *ibid.*, 23/viii. 1955, K. IWATA leg.; 1 ♀, Kainan, Wakayama, 8/x. 1957, S. MOMOI leg.; 1 ♀, Kochi, 5/vii. 1931, Y. SUGIHARA leg.

Host: *Agelena limbata* THORELL and *Tegenaria domestica* CLERCK (after UCHIDA, 1941 and IWATA, 1942).

The life history of this species was stated by IWATA in 1942.

Distribution: Japan (Hokkaido, Honshu and Shikoku).

Polysphincta tenuiabdominalis UCHIDA

Polysphincta tenuiabdominalis UCHIDA, Ins. Mats., 15: 120 (1941); *ibid.*, Trans. Shikoku Ent. Soc., 3: 128 (1953).

As the male has hitherto been undescribed, the following brief description of the male will be given:—

♂. Black. Palpi and tegulae whitish or reddish yellow. Antennae fuscous, several basal joints being yellowish or light brownish ventrally. Legs stramineous to nearly testaceous. Hind femora apically, tibiae except extreme base and median third, and tarsi at each joint apically or almost entirely fuscous.

Length: fore wing ca. 5.0 mm.

Specimens examined: 1 ♀, Sapporo, Hokkaido, 30/ix. 1954, S. TAKAGI leg.; 1 ♀, *ibid.*, 14/ix. 1955, S. MOMOI leg.; 1 ♀ (Holotype), Jozankei, Hokkaido, 10/x. 1906, S. MATSUMURA leg.; 1 ♀, *ibid.*, 5/viii. 1955, 2 ♀♀, Towada, Aomori, 16/viii. 1955, 1 ♀, Amagi, Shizuoka, 27/v. 1955, 1 ♀, Hakusan, Ishikawa, 19/viii. 1953, S. MOMOI leg.; 1 ♂, Hirasano, Shiga, 18/xi. 1929, 1 ♀, *ibid.*, 19/xi. 1929, 1 ♂, Nara, 24/v. 1927, C. TERANISHI leg.; 1 ♂, Kozagawa, Wakayama, 21/ix. 1957, 1 ♂, Kainan, Wakayama, 5/x. 1957, S. MOMOI leg.; 1 ♀, Sasayama, Hyogo, 21/vii. 1952, 1 ♀, *ibid.*, 27/v. 1954, K. IWATA leg.; 1 ♀, *ibid.*, 15/vii. 1953, S. TANIGUCHI leg.; 1 ♀, Hyonosen, Hyogo, 9/viii. 1951, A. NAGATOMI leg.; 1 ♀, Omogo, Ehime, 26/vii. 1948, T. KOBAYASHI leg.

Distribution: Japan (Hokkaido, Honshu and Shikoku).

This species is somewhat variable in the coloration of the legs. In the female the hind legs are sometimes nearly throughout fuscous or black. The fore and middle coxae and femora are also sometimes infuscated. Further, in a female from Sapporo the color pattern of the hind legs is quite similar to that of the male.

Polysphincta unicarinata sp. nov.

♀. Head polished, little less than half as thick as wide seen from above. Temples strongly sloping but not or scarcely rounded, little longer than half of eyes seen in profile. Frons shallowly excavated above antennal sockets. Face weakly, rarely distinctly longitudinal, sparsely pubescent. Clypeus about three fifths as long as wide, entirely gently convex, broadly rounded and reflexed at apex. Malar space more than half as long as basal width of mandible. Mandibles, when somewhat opened and in frontal view, with lower tooth not directly posterior to upper tooth but visible at an upper level. Ocellar diameter subequal to ocellular space and little longer than postocellar space. Antennae 28- or 29-jointed, barely thinner apically, with basal flagellar joint slightly shorter than one and a half times length of joint 2. Thorax polished, with only sides of propodeum rather distinctly pubescent and more or less rough. Mesonotum sparsely pilose, with notauli acute, nearly meeting behind tegulae. Propodeum sometimes

longitudinally sulcate medially, with petiolar area defined by a sharp carina above. Stigma about four and a half times as long as wide, radius originating from the middle. Intercubitus nearly half as long as abscissa 2 of cubitus. Nervellus broken at middle, but without distinct discoidella. Hind femora about six times as long as wide. Hind tarsi with basal joint longer than following 3 joints together and apical joint about twice as long as joint 3. Abdomen slender, polished basally, becoming densely pubescent apically. Tergite 1 about twice as long as apical width, with dorsal carinae weak, nearly reaching apex or almost obsolete behind summit, with apical oblique impressions shallow and interrupted apically by a median elevation. Tergite 2 as long as apical width, more or less aciculate baso-laterally, with lateral round elevations setting off by basal and apical impressions. Tergites 3 and 4 weakly transverse, similar to the preceding tergite in structure and sculpture but more indistinctly so. Ovipositor gradually tapering towards apex. Sheath about as long as basal tergite.

Black with abdomen sometimes brownish. Mandibles, scutellum and postscutellum brownish or reddish. Palpi and tegulae white. Antennae light brown, several basal joints being yellowish ventrally. Legs stramineous. Hind tibiae with apical third and subbasal narrow annuli fuscous. Hind femora often more or less fuscous apically. Wings hyaline, veins and stigma light brown.

Length: fore wing ca. 6.0 mm.

♂. Abdomen slightly more slender. Hind femora less than five times as long as wide. Otherwise virtually identical with the female.

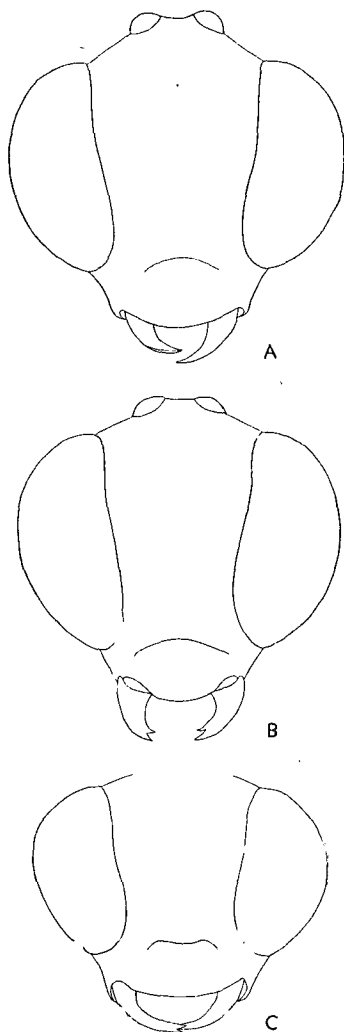


Fig. 1. Head in frontal aspect:

A, *Polysphincta varicarinata* sp. nov.; B, *P. unicarinata* sp. nov.; C, *Zatypota gracilipes* sp. nov.

Holotype: ♀, Okunikko, Tochigi, 14/ix. 1957, S. MOMOI leg.

Paratypes: 1 ♂, Teshio, Hokkaido, 6/ix. 1957, K. KAMIJO leg.; 4 ♀♀, Maruyama, Hokkaido, 7-15/vii. 1955, 3 ♀♀, Okunikko, Tochigi, 13/ix. 1957, 1 ♂, Hikosan, Fukuoka, 26/v. 1956, S. MOMOI leg.

Distribution: Japan (Hokkaido, Honshu and Kyushu).

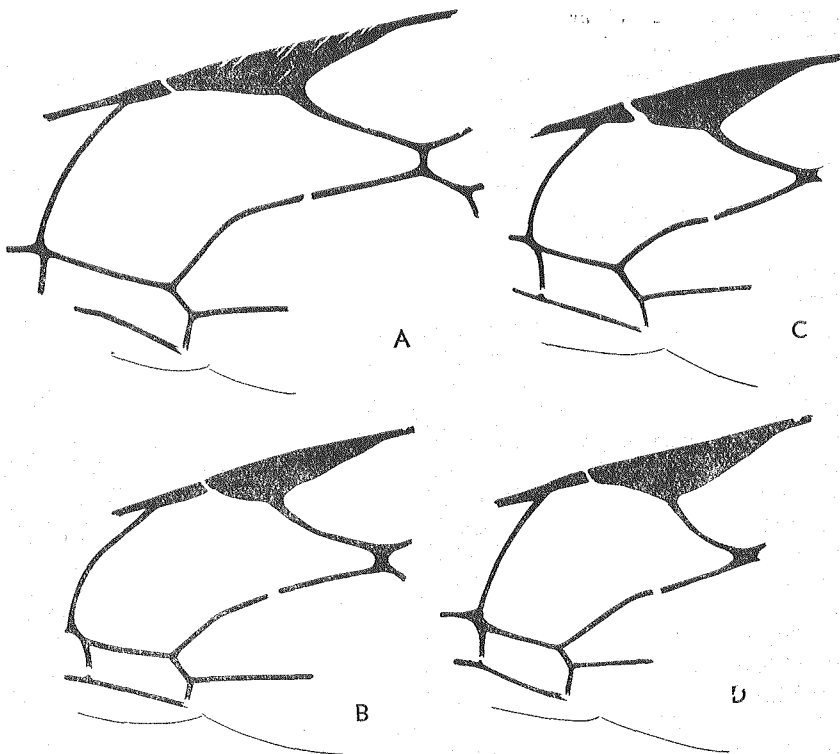


Fig. 2. Part of fore wing: A, *Polysphincta unicarinata* sp. nov.; B, *P. varicarinata* sp. nov.; C, *Zatypota albicoxa* (WALKER); D, *Z. gracilipes* sp. nov.

This species is closely allied to *P. clypeata* HOLMGREN, but is regarded here as a distinct species on account of the presence of the dorsal carinae on the basal tergite and of the more distinct abdominal tubercles as well as the paler hind tarsi. It is also very similar to *P. tenuiabdominalis* UCHIDA, from which it may be easily distinguishable in having the sharply defined petiolar area of the propodeum.

Polysphincta varicarinata sp. nov.

♀. Body rather distinctly pubescent. Head much more than half as long as wide seen from above, strongly arched above level of eyes seen from front. Temples strongly receding, weakly convex, about two thirds as long as eyes seen in profile. Frons not excavated, flat. Face nearly as long as wide, very finely

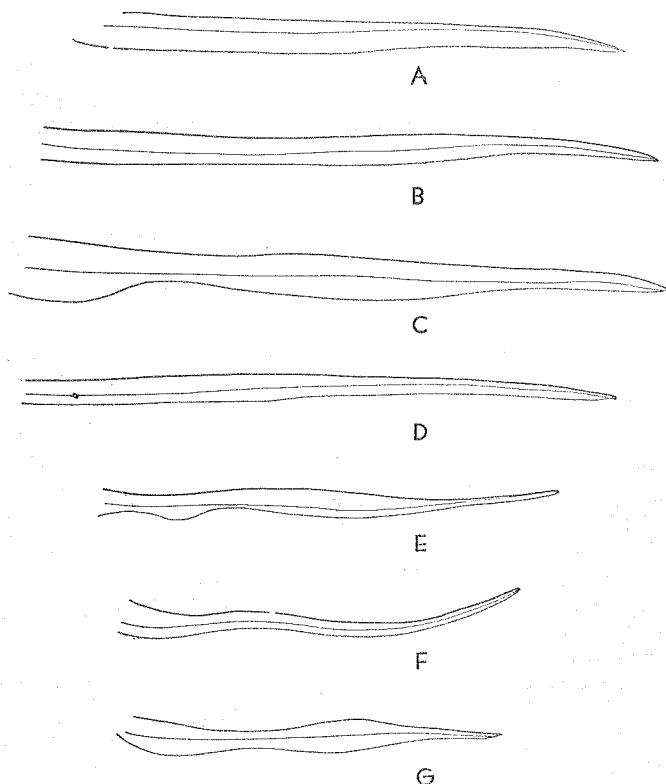


Fig. 3. Ovipositor in lateral aspect: A, *Polysphincta nikkoensis* UCHIDA; B, *P. tenuiabdominalis* UCHIDA; C, *P. tuberculata* UCHIDA; D, *P. unicarinata* sp. nov.; E, *P. varicarinata* sp. nov.; F, *Zatypota albicoxa* (WALKER); G, *Z. gracilipes* sp. nov.

and sparsely punctate, with pubescence short, dense. Clypeus about two thirds as long as wide, convex basally, flat in apical half, broadly rounded and reflexed at apex. Malar space nearly as long as basal width of mandibles. Mandibles, when somewhat opened and in frontal view, with lower tooth directly posterior

to upper tooth and not visible. Ocellar diameter little longer than postocellar space and about two thirds as long as ocellocular space. Antennae 26- to 28-jointed, slightly dilated apically, with basal flagellar joint about one and a half times as long as joint 2. Mesonotum densely pubescent, with notauli rather acute, almost meeting behind tegulae. Mesopleura ventrally, entire sternum and metapleura finely punctate and densely pubescent, more coarsely punctate on prepectus. Propodeum roughend, with a H- or X-shaped carina at apical third of the dorsal surface. Stigma about four and a half times as long as wide, radius originating from distinctly before the middle. Intercubitus very short. Nervellus unbroken. Legs long and slender. Hind femora about six times as long as wide. Hind tarsi with basal joint shorter than following 2 joints together and apical joint somewhat longer and thicker than joint 3. Abdomen slender, broadened and more densely pubescent towards apex. Tergite 1 fully twice as long as apical width, with dorsal carinae reaching near apex, close together, with apical oblique impressions originating from middle of sides of the tergite and interrupted apically by a median elevation. Tergite 2 longer than apical width, with basal oblique and apical transverse impressions and lateral round elevations. Tergite 3 and following tergites transverse, with elevations and impressions almost obsolete. Ovipositor with subbasal and median swellings. Sheath about as long as basal tergite.

Black. Mandibles and apical portion of clypeus light brownish. Palpi white. Tegulae testaceous. Antennae black throughout. Hind legs fuscous. Fore and middle legs fusco-testaceous, the anterior one somewhat paler basally. Wings hyaline, veins and stigma light brown.

Length: fore wing ca. 4.0 to 4.5 mm.

♂. Unknown.

Holotype: ♀, Aizankei, Hokkaido, 4/viii. 1956, S. MOMOI leg.

Paratypes: 2 ♀♀, Aizankei, Hokkaido, 4/viii. 1956, S. MOMOI leg.; 1 ♀, Dai-setsu, Hokkaido, 22-26/vii. 1957, S. MOMOI et al. leg.

Distribution: Japan (Hokkaido).

This species is characterized by the very short intercubitus of the fore wings and the unbroken nervellus of the hind wings. In these features it is somewhat allied to *P. pallipes* HOLMGREN, but the tubercles of the median tergites are nearly obsolete in the present species.

Genus *Zatypota* FÖRSTER

Zatypota FÖRSTER, Naturh. Ver. Rheinlande Verh., 25: 166 (1886).

Polisphinctopsis HABERMEHL. Ztschr. Wiss. Ins.-Biol., 13: 167 (1917).

Genotype: *Ichneumon percontatorius* MÜLLER.

Key to the Japanese species

1. Ocellar diameter longer than ocellocular space. Petiolar area of propodeum completely defined by a sharp carina above. Nervulus and abscissa 3 of discoides strongly oblique, the latter about as long as abscissa 2 or shorter.

Legs not slender unusually, hind femora in ♀ about five times as long as wide. Ovipositor slender, distinctly curved apically, without a median swelling. *albicoxa* (WALKER)

- Ocellar diameter shorter than ocellular space. Petiolar area of propodeum without such a sharp carina above. Nervulus and abscissa 3 of discoideus not strongly oblique, the latter distinctly longer than abscissa 2. Legs very slender, hind femora in ♀ about eight times as long as wide. Ovipositor stout, not curved apically, with a distinct swelling behind middle.
 *gracilipes* sp. nov.

Zatypota albicoxa (WALKER)

Glypta albicoxa WALKER, Cist. Ent., 1: 304 (1874).

Polysphincta eximia SCHMIEDEKNECHT, Opus. Ichn., 1170 (1907).

Clistopiga incitator MORLEY (nec FABRICIUS), Entom., 56: 133 (1914).

Polysphinctopsis eximia HABERMEHL, Ztschr. Wiss. Ins.-Biol., 13: 167 (1918); SCHMIEDEKNECHT, Opus. Ichn., Suppl., 21: 27 (1934).

Polysphincta (*Zatypota*) *eximia* ROMAN, Ent. Medd., 14: 208 (1922).

Polysphincta japonica UCHIDA, Ins. Mats., 1: 173 (1927).

Polysphinctopsis japonicus UCHIDA, J. Fac. Agr., Hokk. Imp. Univ., 25: 70 (1928); *ibid.*, Trans. Sapp. Nat. Hist. Soc., 11: 87 (1930).

Polysphinctopsis eximia f. *nigrithorax* UCHIDA, Ins. Mats., 11: 54 (1936).

Zatypota albicoxa UCHIDA, Ins. Mats., 14: 112 (1940); *ibid.*, Ins. Mats., 15: 122 (1941).

Zatypota albicoxa f. *nigrithorax* UCHIDA, Ins. Mats., 15: 122 (1941).

Specimens examined: 1 ♀, Yambetsu, Kunashiri, Kuriles, 22-25/vii. 1935, T. UCHIDA leg.; 1 ♀, Aizankei, Hokkaido, 2/viii. 1956, S. MOMOI leg.; 1 ♀, Tomuraushi, Hokkaido, T. NAKASHIMA leg.; 1 ♀, Sapporo, Hokkaido, 10/vii. 1940, 1 ♀, *ibid.*, 20/ix. 1940, T. UCHIDA leg.; 1 ♀, *ibid.*, 5/viii. 1955, 1 ♀, *ibid.*, 25/ix. 1955, 2 ♀♀, *ibid.*, 8/viii. 1956, 1 ♀, *ibid.*, 30/v. 1957, 3 ♀♀, Gamushi, Hokkaido, 10-20/viii. 1956, S. MOMOI leg.; 1 ♀, 1 ♂, Mitaka, Tokyo, 28/viii. 1957, T. NAMBU leg.; 1 ♀, Oshima, Tokyo, 18/x. 1927, M. YAMANAKA leg.; 1 ♀ (Holotype of *japonica*), 2 ♂♂, Toyama, 1926, K. TAKEWAKI leg.; 1 ♀, *ibid.*, 23/viii. 1955, S. TAKAGI leg.; 1 ♀, Kyoto, 1/viii. 1925, 1 ♀, *ibid.*, 13/ix. 1926, K. TAKEUCHI leg.; 1 ♀, Minoo, Osaka, 3/vi. 1930, 1 ♀, Sasa-yama, Hyogo, 1/ix. 1954, K. IWATA leg.; 1 ♀, Hyonosen, Hyogo, 7/viii. 1951, A. NAGATOMI leg.; 1 ♀, Omogo, Ehime, 7/ix. 1952, T. EDASHIGE leg.

Host: *Theridion tepidariorum* KOCH (after IWATA, 1942).

The life history of this species was stated by IWATA in 1942.

Distribution: Japan (Hokkaido, Honshu and Shikoku), Kuriles and Europe.

Zatypota gracilipes sp. nov.

♀. Body entirely smooth and polished with only sides of propodeum somewhat rough and rather distinctly pubescent. Head slightly longer than half of width seen from above. Temples strongly receding and weakly rounded, about two thirds as long as eyes seen in profile. Face little shorter than width at

bottom, with long and sparse pubescence. Clypeus strongly transverse, about half as long as wide, very broadly rounded at apex. Malar space distinctly shorter than basal width of mandible. Mandibles unusually slender and long. Ocellar diameter about as long as postocellar space and much less than ocellular space. Antennae 20-jointed, scarcely dilated apically. Mesonotum highly polished, nearly five sixths as wide as long, with notauli scarcely reaching tegulae. Propodeum with sharp median carinae parallel and extending apical transverse carina, which is almost erased besides the median carinae. Legs unusually long and slender. Hind femora fully eight times as long as wide. Hind tarsi with basal joint about as long as following 3 joints together and apical joint about as long as joint 3 but thicker. Stigma about three and a half times as long as wide. Radius and cubitus almost contiguous. Nervulus and abscissa 3 of discoideus not strongly oblique, the latter distinctly longer than abscissa 2. Nervellus unbroken. Tergite 1 slightly longer than apical width, weakly broadened posteriorly, with dorsal carinae reaching apical oblique furrows, which are acute and weakly striate. Tergite 2 slightly shorter than apical width, with apical and basal oblique furrows setting off acutely a rhomboid median area, the furrows more or less striate. Tergites 3 and 4 transverse, nearly parallel-sided, similar in structure to the preceding tergite, but the furrows much less distinctly striate. Tergite 5 with only traces of apical furrows. Ovipositor not curved apically, with distinct swellings near base and behind middle. Sheath slightly longer than tergite 1.

Black, partially somewhat brownish. Mandibles except extreme apices and clypeus apically light brownish. Palpi, humeral angles of pronotum and tegulae stramineous. Scutellum brownish. Antennae fuscous, several basal joints being light brownish ventrally. Legs stramineous, with all femora apically, tibiae and tarsi somewhat brownish except hind tibiae which are whitish medially. Hind tibiae with apical third and subbasal narrow annuli, and apical joint of hind tarsi fuscous. Wings hyaline, stigma and veins light brown.

Length: fore wing ca. 4.0 mm.

♂. Unknown.

Holotype: ♀, Apoi, Hokkaido, 22/viii. 1957, S. MOMOI leg.

Distribution: Japan (Hokkaido).

The present species is characterized by the almost entirely polished body, the long and slender mandibles, the incompletely defined petiolar area of the propodeum and the unusually slender legs.

On this occasion, the junior writer intends to express his cordial gratitude to Prof. KUNIO IWATA for his constant encouragement through the present study.